AMENDMENTS TO THE SPECIFICATION:

Please add two new paragraphs after the fifth paragraph (that is, after line 24) on page 6, as follows:

--Figure 4 shows a block diagram demonstrating an exemplary embodiment of the present invention.

Figure 5 shows a sensor having a helical optical fiber according to an exemplary embodiment of the present invention.--

Please add the following new paragraphs after the third paragraph (i.e., after line 27) on page 11 as follows:

--Figure 4 depicts a method according to the present invention including a first step of mechanically coupling at least one of the first and second locations to a substantially helically coiled optical fiber 10. The next step involves coupling an optical signal having a known polarization state into the substantially helically coiled optical fiber 11. The next steps involves recording the optical signal transmitted over a connecting line for acquiring information pertaining to a polarization state of the optical signal 12, and determining the change in the distance from the information pertaining to the polarization state of the optical signal 13. The final step involves comparing the polarization state of the optical signal before its transmission and a reference polarization state 14.

Figure 5 depicts an exemplary embodiment similar to that shown in Figure 1A, plus a reference optical fiber path 21. The optical fiber may have a fixed winding direction. In the case of an arbitrarily bent fiber, it may be sufficient when one winding direction predominates.

In addition, the optical fiber has a cladding which holds the fiber in its helically bent form and is capable of elastically following movements, in particular those along the longitudinal axis

of the coil. For this, the coils, as such, can also be embedded in an elastic substrate material, for example, in an elastic cylinder or the like.

The sensor also includes a light source 23, which may be a laser. Linearly polarized light emanating from light source 23 is launched into fiber coil 21. In the case that the light source does not emit fully polarized light, a polarizer P2 can be positioned at the fiber input end to produce the defined polarization state. At the output end of the fiber coil, the polarization state of the transmitted optical signal can be measured using a polarimeter 22. Alternatively, one can use a simple detector having a series-connected or upstream analyzer to measure the intensity of a defined polarization component.--